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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, JENNIFER F

ART UNIT	PAPER NUMBER
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2821

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/575,347	Applicant(s) KIM ET AL.	
	Examiner JENNIFER F. CHANG	Art Unit 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-8 and 10-18 is/are pending in the application.
- 4a) Of the above claim(s) 2,3 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-8 and 10-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/19/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1, 4-8, 10-18 are presented for examination. Claims 2-3 and 9 have been withdrawn from consideration.
2. Amendment B received September 19, 2008 has been entered into the record.

Response to Arguments

3. Objections to the specification and claims 10, 13, 14 and 18 are overcome by amendment.
4. Rejections under 35 U.S.C. 112, second paragraph, to claims 11, 12, 15, and 16 are overcome by amendment.
5. Rejections under 35 U.S.C. 112 first paragraph directed to the limitation that the second radiation patch has a length shorter than the length of the shorting plate are withdrawn.
Although the original specification and claims teach that the second radiation patch has a length shorter than the length of the *first radiation patch*, not the shorting plate, the specification does teach that h_s is shorter than h . Fig. 2 indicates h as the length of the shorting patch, not the first radiation patch. Therefore, the new matter rejection has been withdrawn as the Examiner has interpreted the amendment as correcting only a typographical error, and not changing the scope of the invention.
6. Rejections to claims 1, 4, 6, 7, and 16 under 35 U.S.C. 102(e) over Kenoun are overcome by amendment because Kenoun does not disclose that the shorting plate is in direct physical connection with the ground plate. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

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7. Rejections to claim 8 under 35 U.S.C. 102(b) over Chen are overcome by amendment because Chen does not disclose a second radiation patch coupled to at least one of the edges of the first radiation patch and disposed between the first radiation patch and the ground plate. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original specification and drawings do not explicitly teach or imply that the second radiation patch connects the first radiation patch and the ground plate.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claim 5 is rejection under 35 U.S.C. 112, second paragraph. Claim 5 recites the limitations "the number of corrugated hollows," "the corrugated edge," and "the predetermined length and width of the corrugated hollows." There is insufficient antecedent basis for the

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limitations in the claim. Claims 1 and 4, from which claim 5 depends, do not teach the antenna comprises a corrugated edge or corrugated hollows.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1, 4-8, 10, 11, 13 rejected under 35 U.S.C. 103(a) as being anticipated by Chen (US 2003/0038750) in view of Kenoun.

14. As to claim 1, Chen teaches a planar inverted F antenna having a radiation patch, comprising:

- a first radiation patch (22, Fig. 2) radiating a signal;
- a ground plate (20, Fig. 2) for grounding the first radiation patch;
- a feeding line (26, Fig. 2) for supplying an electric power to the first radiation patch;
- a shorting plate (24, Fig. 2) having a length disposed between the first radiation patch and the ground plate, and said shorting plate being in direct physical connection with the first radiation patch along a first width and the ground plate for shorting the first radiation patch along a second width, said second width being located opposite to the first width.

Chen does not teach a second radiation patch connecting the first radiation patch and the ground plate and having a length shorter than the length of the shorting plate. Kenoun teaches a

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second radiation patch (117, Fig.1) having a length shorter than the length of a shorting plate (130, Fig. 2). Kenoun does not teach that the second radiation patch connects the first radiation patch and the ground plate, but this limitation has been addressed above as constituting new subject matter not supported in the original disclosure. It would have been obvious to one of ordinary skill in the art to modify the antenna taught by Chen by adding a second radiation patch as taught by Kenoun because the second radiation patch provides a means for altering the electrical length of the antenna without requiring additional space and allows the antenna to be tuned to other frequencies [0016].

15. As to claim 4, the length and a width of the second radiation patch are determined according to a desired resonant frequency ("Additional adjustments may be made, such as reducing the height and increasing the width of component of the antenna assembly based on tuning requirements," [0019]).

16. As to claim 5, Chen teaches the number of corrugated hollows defined in the corrugated edge and the predetermined length and width of the corrugated hollows are determined according to the desired resonant frequency [0011]. Chen does not explicitly teach a ratio of taper in the first radiation patch is determined according to the desired resonant frequency, but one of ordinary skill in the art would recognize that the tapering of an edge of the radiator would also affect the electrical length of the radiator and therefore contribute to determining the desired resonant frequency.

17. As to claim 6, Kenoun teaches the second radiation patch (117, Fig. 3) is located on a side of the first radiation patch opposite to the shorting plate (125, Fig. 2).

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18. As to claim 7, Kenoun teaches the second radiation patch (117, Fig. 2) is located on a side of the first radiation patch adjacent to the shorting plate (130, Fig. 2).

19. As to claim 8, Chen teaches a planar inverted F antenna having a radiation patch, comprising:

- a first radiation patch (22, Fig. 2) for radiating a signal, comprising:

- a first edge (29, Fig. 2);

- a second edge parallel to the first edge and having a length smaller than a length of the first edge (a portion of 28, Fig. 2 that extends from the corner to the beginning of the corrugated portion);

- a third edge adjacent to the first edge and connecting the first edge and the second edge at a first point and a second point (Fig. 2), respectively;

- a fourth edge adjacent to the first edge and parallel to the third edge, said fourth edge connecting the first edge at a third point (Fig. 2); and

- a corrugated edge (portion of 28, Fig. 2) connecting the fourth edge and the second edge at fourth and fifth points, respectively, wherein said fourth point is located away from the third point and on the fourth edge and said fifth point being located away from the second point and on the second edge;

- a ground plate (20, Fig. 2) for grounding the first radiation patch;

- a feeding line (26, Fig. 2) for supplying an electric power to the first radiation patch; and

- a shorting plate (24, Fig. 2) disposed between the first radiation patch and the ground plate, wherein said first radiation patch is disposed in a plane parallel to the ground plate (“flat metal plate 22 in parallel with the metal ground plane,” [0022]).

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Chen does not teach a second radiation patch coupled to at least one of the edges of the first radiation patch and disposed between the first radiation patch and the ground plate. Kenoun teaches a second radiation patch (117, Fig. 4) coupled to at least one of the edges of a first radiation patch (120, Fig. 4) and disposed between the first radiation patch and the ground plate. It would have been obvious to one of ordinary skill in the art to modify the antenna taught by Chen by adding a second radiation patch as taught by Kenoun because the second radiation patch provides a means for altering the electrical length of the antenna without requiring additional space and allows the antenna to be tuned to other frequencies [0016].

20. As to claim 10, Chen teaches the shorting plate (24, Fig. 2) has a length disposed between the first radiation patch (22, Fig. 2) and the ground plate (20, Fig. 2), and coupled to the first radiation patch along a first width (29, Fig. 2) and coupled to the ground plate for shorting the radiation patch along a second width, said second width being located opposite to the first width.

21. As to claim 11, (29, Fig. 2) the first width is coupled to the first edge of the radiation patch.

22. As to claim 13, Kenoun teaches the length of the shorting plate (130, Fig. 2) is greater than a length of the second radiation patch (117, Fig. 1).

23. As to claim 17, Kenoun teaches the length and a width of the second radiation patch are determined according to a desired frequency ("Additional adjustments may be made, such as reducing the height and increasing the width of component of the antenna assembly based on tuning requirements," [0019]).

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24. Claims 12, 14, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Kenoun further in view of Weinberger (US 6,483,462 – cited by Applicant).

25. As to claim 12, Chen in view of Kenoun teach the antenna substantially as claimed as applied to claim 10, but do not explicitly teach the first width (of the shorting plate) is coupled to the fourth edge of the first radiation patch. Weinberger teaches a planar inverted F antenna and further teaches that the position for the shorting plate (i.e. the ground connection) can lie on different sides or edges of the radiator structure (col. 4, lines 6-7). Therefore, it would have been obvious to one of ordinary skill in the art to modify the shorting plate by placing it along different edges of the radiator and the modification would have yielded predictable results to one of ordinary skill in the art.

26. As to claim 14, Kenoun teaches the length of the shorting plate (130, Fig. 2) is greater than a length of the second radiation patch (117, Fig. 1).

27. As to claim 15, Chen in view of Kenoun teach the antenna substantially as claimed as applied to claim 8 above, but do not teach the first radiation patch is tapered along the corrugated edge. Weinberger teaches a planar inverted F antenna with corrugated edge (Fig. 1) and further teaches that appropriate shaping of the individual radiator elements by graduation and tapering can be further modified or improved to match the geometry of the housing (col. 4, lines 24-29). Furthermore, Fig. 2J provides an example of a tapered corrugated edge of a planar inverted F antenna. Therefore, it would have been obvious to one of ordinary skill in the art to modify the corrugated edge of Chen by tapering it to further tune the radiator to a desired operating

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bandwidth or to manipulate the shape of the radiator to fit a housing of a portable terminal, and the modification would have yielded predictable results to one of ordinary skill in the art.

28. As to claim 16, Chen in view of Kenoun teach the invention substantially as claimed but do not explicitly teach the feeding line is disposed between the first edge of the first radiation patch and the ground plate. Weinberger teaches a planar inverted F antenna and further teaches the feed can lie at different sides or edges of the radiator structure (col. 4, lines 6-7). Therefore, it would have been obvious to one of ordinary skill in the art to modify the feeding line of Chen by placing it along the first edge of the radiator instead of in a central portion of the radiator, and the modification would have yielded predictable results to one of ordinary skill in the art.

29. As to claim 18, Chen teaches the number of corrugated hollows defined in the corrugated edge and the predetermined length and width of the corrugated hollows are determined according to the desired resonant frequency [0011]. Chen does not explicitly teach a ratio of taper in the first radiation patch is determined according to the desired resonant frequency, but one of ordinary skill in the art would recognize that the tapering of an edge of the radiator would also affect the electrical length of the radiator and therefore contribute to determining the desired resonant frequency.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER F. CHANG whose telephone number is (571) 270-3831. The examiner can normally be reached on Monday-Friday 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JENNIFER F CHANG/
Examiner, Art Unit 2821

/Douglas W Owens/
Supervisory Patent Examiner, Art Unit 2821
October 11, 2008